

EMERGI



NEW CAREERS COME INTO FOCUS

BY SUSAN REESE

When career and technical education (CTE) began, known then as vocational technical education, only those with the most vivid imaginations and creative minds could envision it as it is today. Many of today's jobs didn't even exist when the baby boomers entered the workforce. Over the decades, CTE has maintained its commitment to preparing a skilled workforce, but those skills have changed remarkably. The founders of CTE would be amazed at some of the careers that have emerged over the years.

In the 1960s, the age of space exploration marked advances in science and technology and, as a result, career fields began evolving, as the space-age technology transferred into other industries. In the late 70s, Steve Wozniak designed the first Apple computer, and in 1981, IBM sold its first personal computer. A whole

new world of careers began emerging as a result of the rapid growth in information technology. Today, the changes seem to be coming at a lightning-fast speed, and new legislation and regulations as well as new business practices and changing demographics can also result in specialized areas of occupation, but CTE continues working to keep pace.

On the National Association of Colleges and Employers JobWeb.com site, Sharon Jones, career counselor at the University of North Carolina, describes an emerging occupation as "one that has been recognized in small numbers, but continues to grow." Among the emerging careers she identifies are some expected ones, such as nurse anesthetists, health informatics specialists, security engineers, and clinical genomics analysts. There are also some unusual ones. Have you heard of creative perfumers who evaluate odors

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One of the main driving forces bringing new career fields into the forefront is technology.



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and create fragrances? How about human terrain analysts? Jones describes them as professionals who conduct primary research with local leaders in a country and translate conversations and documents from that country. Patent analysts are also on the list. They help local companies determine how new concepts or products are unique and marketable.

Last year, a *CareerBuilder.com* article listed seven emerging jobs. They were home stager, health informatics technician, simulation developer, green jobs, emergency management, career counselor and patient advocate. The article also noted that developments in technology, health care, environmentalism and globalization, as well as current economic trends, are helping certain careers to surface.

Technology Trends

One of the main driving forces bringing new career fields into the forefront is technology. A recent *Career Vision* article noted that three of the emerging

industries are biotechnology, nanotechnology and geospatial technology. In recent years, CTE has been tracking the technology and adjusting its offerings accordingly. For example, nanotechnology programs have been increasing at community and technical schools over the past five years. One of those is North Seattle Community College, which became the first college in its state to offer an associate of applied science degree in nanotechnology. The multidisciplinary program exposes students to clean room procedures, including an understanding and maintenance of nano/micro fabrication and characterization equipment.

In 2005, Wisconsin's Chippewa Valley Technical College was one of several technical colleges that partnered with the University of Wisconsin to create the state's first nanoscience technology degree. Recognizing the impending growth in the field, the partnership aimed to attract nanotechnology industries to the area, including nanoparticle manufacturing, micro-fabrication and

the medical device industry. Chippewa Valley also partnered with Minnesota's Dakota County Technical College (DCTC) to develop the program's curriculum. DCTC's other partners include more than 25 corporations that serve on advisory committees and provide guest lecturers and laboratory tours. In addition to internships at some of those companies, DCTC's program includes a capstone experience at the University of Minnesota with lectures and experience in the university's nanofabrication lab, materials characterization lab and the nanoparticles/biotechnology labs.

According to the National Nanotechnology Initiative, the worldwide workforce necessary to support the field of nanotechnology is estimated to be 2 million by 2015, and the National Science Foundation estimates a need of four to five technicians for every Ph.D. scientist or engineer. CTE clearly has a role to play in fulfilling that need.

Geospatial technology is one of the other emerging industries often cited; geospatial information systems (GIS) programs are being created or are evolving from other programs such as surveying and mapping. In 2008, Southern Maine Community College received a three-year grant from the National Science Foundation for a project called "A Collaborative Model for Geospatial Technology Education in a Rural Region." The goal was to meet the growing need for workers skilled in the field. Other colleges involved in the project include the University of Maine, Kennebec Valley Community College, the University of Southern Maine and Washington County Community College.

Penta Career Center in Ohio also has a GIS program that uses STARS, a certification program for technical schools, colleges and universities, as well as high schools. Indicative of the emergence of this industry is the fact that the National SkillsUSA Championships now include a geospatial technology competition.

The Seeds of New Careers

While many of these industries are exploring new frontiers, they are also reshaping traditional areas of CTE. Biotechnology is now infused into agriculture education, and new careers are becoming part of the landscape. One of the careers on the CareerOneStop site is precision agriculture technician. The description says that these technicians apply geospatial technologies to agricultural production and management activities such as pest scouting, site-specific pesticide application, yield mapping and variable-rate irrigation. Computers and GPS are now used to develop maps and remote sensing images for analysis of the topography and data on soil, fertilizer, pests or weather.

One of the schools offering a precision agriculture application technician certificate is Minnesota West Community and Technical College. Among the courses in the 26-credit program are Principles of Agronomy, Introduction to Soil Science,

Custom Application, Weed Control, and Corn and Soybean Production. There is also a GIS/GPS course.

Health care and energy are two more fields in which careers are evolving. In 2010, the Community College of Allegheny County announced the results of a study it had commissioned to identify emerging careers in the Greater Pittsburgh area. The three industries identified as having the most potential growth and economic impact were health care and life sciences; energy; and financial services and insurance—with energy and health care having the most positive employment outlook.

The technological changes in health care have certainly been revolutionary, and new careers continue to emerge in the field. Programs, such as the one at St. Phillip's College—one of the Alamo Community Colleges in Texas—are preparing technicians to install, repair, maintain and operate biomedical equipment. In Oklahoma, Canadian Valley

Technology Center was chosen as one of the initial sites to launch a biomedical sciences program in 2007, and the program has continued to grow.

As part of its Allied Health Division, Jefferson Community and Technical College (JCTC) in Kentucky offers a volumetric medical imaging (VMI) program. The program's Web site describes VMI as the next generation of medical imaging and offers this explanation of its application: The data obtained from computerized tomography (CT) or magnetic resonance imaging (MRI) traditionally consists of a 2D "slice" through the body, but with advancing technology, the number of slices obtained per patient has increased to the point that physicians have an overwhelming amount of information to review. To manage the amount of data, software has been developed to combine the set of 2D slices into one comprehensive 3D volume that accurately represents the internal anatomy. The VMI program builds upon previ-

In the News

Here is a brief look at more possibly emerging careers.

Digital Signage

Texas State Technical College has launched the nation's first digital signage degree technology program as an associate degree. The two-year program is completely online and pairs a graphic design degree with marketing strategy and applies it to the digital signage medium.

Social Media

A November 2008 article on OnlineMarket-erBlog.com listed "5 New Social Media Jobs You Will Fill in the Next 5 Years." Noting that social media has already changed business profoundly, the article suggests these are five employees businesses might hire in the next five years whose positions didn't exist five years ago. They are international community compliance chief, community manager, online reputa-

tion manager, blogger outreach manager/blog cultivation expert, and chief conversation officer. An April 25 article in the *Danbury News-Times* tells about Western Connecticut State University student Eddie Maher, who was offered an internship as a social media marketing specialist for an engineering company in Danbury. Maher says that at a recent university job fair a lot of recruiters were advertising jobs that solely had to do with social media.

Application Security

In February 2010, GovInfoSecurity.com noted that application security is rapidly becoming the next "hot focus area" for information security professionals, as the pressure to secure personal and financial data increases. Rolf von Roessing, international vice president of ISACA

(previously known as the Information Systems Audit and Control Association), says, "Growth is seen in the identity management and access control field, which is a reaction of the market to heightened security and new threats."

Anti-Fraud Examiner

According to the Association of Certified Fraud Examiners (ACFE), "In the wake of far-reaching scandals such as Enron and WorldCom, and sweeping legislation like the Sarbanes-Oxley act, there is a growing demand for individuals with fraud examination skills who can help organizations in the detection and deterrence of fraud." ACFE made a first-of-its-kind donation to York College of The City University of New York at the end of 2008 to endow a professorship in anti-fraud education. 

As new technologies and innovative ideas continue to appear on the horizon, even those already in the workforce will need to update their education and training.

ously acquired skills, since admission into the program requires that a student must have already completed an associate degree in radiology technology or CAD.

Green careers are often cited as an emerging area, and they also can build upon previous programs. This past June, Gateway Technical College and the University of Wisconsin-Parkside announced an agreement that provides pathways for associate degree graduates in two Gateway programs to transfer their credits to UW-Parkside and work toward a four-year degree. The two programs are Civil Engineering Technology-Freshwater Resources and Air Conditioning Heating and Refrigeration Technology with an emphasis in geoexchange technology. Geoexchange technology uses the renewable energy just below the earth's surface for heating or cooling buildings and for domestic hot water.

In announcing the agreement, Gateway President Bryan Albrecht noted that educational partnerships such as this one were meeting community needs, and he added, "The University of Wisconsin-Parkside is a very important educational partner. Together, we can offer improved options for our students in these emerging green career areas."

New Energy, New Careers

In the fall of 2009, Minnesota West was one of nine Minnesota State Colleges and Universities to launch a new energy technical specialist degree that prepares students to work in either the renewable energy field or traditional energy industries. It is largely funded with a

three-year \$1 million High Growth Job Training Initiative grant from the U.S. Department of Labor. The new two-year degree program, along with the specialized energy certificates, complements Minnesota West's offerings in biofuels technology and wind energy technology. Besides the energy technical specialist degree, students may also earn a certificate in one of four specialties: ethanol production, biodiesel production, wind turbine maintenance and solar energy assessment.

In announcing the new program, Chancellor James McCormick stated, "This innovative approach enables our colleges and universities to meet a critical need of Minnesota's traditional and emerging energy industries. Traditional energy employers have an aging workforce, while renewable energy producers are struggling to find workers with appropriate technical skills. These new opportunities for students will advance one of our strategic directions, which is to enhance the state's economic competitiveness."

In 2010, Cincinnati State Technical and Community College announced that it was adding at least two innovative new programs to its offerings. One is a new major that will be part of its power systems engineering technology program centering on "Smart Grid" technology, which involves the way households, businesses and factories use electric power. Larry Feist, chairman of the Energy Efficiency and Renewable Energy Major at Cincinnati State says that the Smart Grid major is designed to capitalize on

both the short-term demand for technicians to install new generations of electric and gas meters, and on the longer-range need for specialists who will be able to maintain the new systems and work on the distribution and transmission aspects of the electrical grid.

According to a news release issued by Cincinnati State, Duke Energy was among the 100 utilities that received federal stimulus funds to accelerate the installation of "smart" electric meters in homes and businesses, and Mark Wyatt, Duke Energy's vice president of smart grid and energy systems, had this to say about the new program: "Smart, digital technology is changing the face of the energy industry in much the same way wireless changed the telephone business. Having a major devoted to understanding how this technology integrates with today's grid is an important first step in preparing tomorrow's energy professionals."

The second new program being launched this fall at Cincinnati State is the associate degree program in stormwater management. Ann Gunkel, chair of the institution's Environmental Engineering Technology program, notes that the federal Clean Water Act is making stormwater management a priority throughout the nation. Students in the program will take core courses within the environmental engineering technologies curriculum, in addition to specialty courses such as environmental mapping, watershed management and stormwater management.

During hard storms—and this year has been one that has seen severe storms in many parts of the country—untreated sewage can flow into waterways through relief valves. So stormwater management is becoming a priority in reducing these dangerous overflows. As Academic Vice President Monica Posey explains, "Cincinnati State has worked closely with our partners in industry and local government to design a major that will serve an emerging need in the workplace."

Emerging Pathways

Minnesota West is also helping to bring education in renewable energy to the high school level in its state. This past summer at its Granite Falls Campus, six math, science and agriculture teachers from Southwest Minnesota high schools completed the second part of the renewable energy training that they began last summer. According to Minnesota West, the focus of the program was to expose the participants to a wide range of emerging and existing renewable energy fields, strengthen the science and math backgrounds of the participants, provide insights on how the emerging energy topics relate to the math and science currently being taught, and help integrate the new material into their high school curriculum so that it can help meet state standards.

North Seattle Community College is also connecting with secondary education by playing a leadership role in developing a seamless nanotechnology education program from the K-12 level through the baccalaureate degree. High school students in Minnesota also have the opportunity to be exposed to nanotechnology as a possible career through a four-day program offered by Dakota County Technical College. In the NanoScience Class, students learn about how nanoscience is changing the world and get to perform experiments and use instruments such as atomic force and scanning tunneling microscopes. They also go to the University of Minnesota to tour the Nanofabrication Center clean room and the Characterization Facility to gain even more exposure and hands-on experience.

In Oklahoma, students begin the two-year biomedical sciences program at the Canadian Valley Technology Center as high school juniors, and according to instructor Erin Crosby, about 80 percent go on to college.

Through Gateway Technical College's agreement with UW-Parkside, students graduating from the freshwater resources

program or the geoexchange program can transfer into UW-Parkside to earn a bachelor's degree in geosciences-soil and water sciences.

CTE to Meet the Emerging Needs

As new technologies and innovative ideas continue to appear on the horizon, even those already in the workforce will need to update their education and training.

CTE will have to be ready for them—but it's a challenge we have faced before, and we have always risen to it. So as new careers continue to emerge, CTE will be there to meet them. **T**

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